What is claimed is:

1. A method for use in a stored program controlled system comprising a plurality of processing units and a signal generator for interconnecting processing units using time division multiplexing over a free space optical beam line, said method including the steps of:

generating and distributing a common clock signal to all processing units;

generating, based on said clock signal, and distributing a common synchronization signal to all processing units;

maintaining in each processing unit, at least one timeslot counter synchronized to the clock signal and to the common synchronization signal;

maintaining in each processing unit, a set of timeslot maps synchronized to said at least one timeslot counter;

deriving an enable signal from the contents of the timeslot map to enable transmission of data into the beam line; and

deriving an enable signal from the contents of the timeslot maps to enable one or more receivers to extract data from the beam line.

2. A method in accordance with claim 1 wherein said signal generator includes a timeslot sync signal generator and each processing unit includes a timeslot sync pattern detector, said method further including the steps of:

generating a timeslot sync signal;

sending said timeslot sync signal to each of said processing units;

receiving said timeslot sync signal at each of said sync pattern detectors; and

synchornizing said enable signal in each of said processing units.

3. A method in accordance with claim 1 wherein said signal generator includes a frame sync pattern generator and each processing unit includes a frame sync pattern detector, said method further including the steps of:

generating a frame sync pattern;

sending said frame sync pattern to each of said processing units;

receiving said frame sync pattern at each of said frame sync pattern detectors, and

synchonizing said timeslot counter in each of said processing units.

4. A method in accordance with claim 1 wherein said steps of distributing said common clock signal and said common synchronization signal comprises injecting said signals into said beam line.

5. A method in accordance with claim 1 wherein each processing unit includes a geographic address input, said method further including the step of:

initializing and maintaining said timeslot maps using said geographic address input.

6. A method in accordance with claim 1 wherein each of said processing units includes a transmit queue, said step of enabling transmission of data into the beam line comprising delivering data to the beam line from said transmit queue.

7. A method in accordance with claim 1 wherein each of said processing units includes a receive queue, said step of enabling extraction of data from the beam line comprising receiving data from the beam line in said receive queue.

8. A method in accordance with claim 1 wherein said step of enableing one or more receivers comprising enabling a plurality of receivers to simultaneous receive signals creating multicast channels.

9. A method in accordance with claim 1 wherein said signal generator includes guard band logic, said method further including the step of:

periodically inserting guard bands into said beam line.

10. A method in accordance with claim 1 further including the step of:

updating said timeslot mapping to provide dynamic load balancing.

11. A method in accordance with claim 1 wherein said time slot mapping comprises distributing timeslots assigned to a given channel evenly throughout said timeslots to minimize latency, said step of deriving an enable singal occuring serially across all of said processing units.

12. An apparatus for use in a stored program controlled system comprising a plurality of processing units for interconnecting processing units using time division multiplexing over a free space optical beam line, said apparatus comprising:

a signal generator including

a clock configure.d to generate and distribute a common clock signal to all processing units;

a synchronization signal generator receiving said clock signal, and configured to distribute a common synchronization signal to all processing units;

each processing unit including

at least one timeslot counter synchronized to the clock signal and to the common synchronization signal;

a set of timeslot maps synchronized to said at least one timeslot counter;

means for deriving an enable signal from the contents of the timeslot map to enable transmission of data into the beam line; and

means for deriving an enable signal from the contents of the timeslot maps to enable one or more receivers to extract data from the beam line.

13. An apparatus in accordance with claim 12 wherein said signal generator includes a timeslot sync pattern generator and each processing unit includes a timeslot sync pattern detector.

14. An apparatus in accordance with claim 12 wherein said signal generator includes a frame sync pattern generator and each processing unit includes a frame sync pattern detector.

15. An apparatus in accordance with claim 12 wherein each processing unit includes a geographic address input configured to initialize and maintain said timeslot maps.

16. An apparatus in accordance with claim 12 wherein each of said processing units includes a transmit queue configured to receive data from said processing unit and deliver data to the beam line.

17. An apparatus in accordance with claim 12 wherein each of said processing units includes a receive queue configured to receive data from the beam line.

18. An apparatus in accordance with claim 12 wherein said signal generator includes guard band logic configured to periodically inserting guard bands into said beam line.